



Borough of Southend-on-Sea.

SPECIAL REPORT
ON
SMALL-POX,

OCCURRING IN THE

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JANUARY TO JUNE, 1902,

BY

J. T. C. NASH, M.D., M.S., D.P.H.,

MEDICAL OFFICER OF HEALTH.

Southend-on-Sea :

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I have from time to time reported briefly on the cases of Smallpox occurring in the Borough of Southend-on-Sea, and on the measures taken for the prevention of the spread of the disease, as duly recorded in the minutes of the proceedings of the Council and Committees. Now that the Borough is happily free of Smallpox it will be of scientific interest to review the facts and lessons taught by the comparatively small number of cases which occurred in Southend, supplementing these, however, by the larger experience of the great city of Glasgow, which furnishes a hitherto unparalleled opportunity of estimating the protective influence of recent vaccination on a smallpox-invaded city of immense population. It will be of advantage to make a few preliminary remarks.

Scientific medical evidence has very clearly demonstrated that the popular idea of vaccination is an erroneous one. Persons without any pathological training, and perhaps one or two qualified medical men who are probably without any *practical* knowledge of Smallpox, have tried by means of crude statistics to settle the question of the relative value of vaccination as a means of combating Smallpox. Now, any attempt to settle this question on statistics based on unscientific popular notions of vaccination, must be to a certain degree fallacious, as I shall show. A large number of cases of Smallpox have occurred in persons who have been placed under the heading of "vaccinated," whereas these persons never have been vaccinated in the *scientific* sense of the term. Who is to decide whether a given case has been vaccinated in the scientific sense?

The armchair critic and compiler of statistics, or the practical physician, who knows the various stages of vaccinia and the character of the scars left?

In view of the importance of the subject, the public should insist that, inasmuch as vaccination is compulsory by legal enactment (subject to the conscience clause), those on whom the duties of vaccination devolve should have a proper understanding of what vaccination really is. I speak from personal knowledge when I say that many a certificate of successful vaccination has been given in the past all over the country, where inoculation has been performed in one place only, with a poor apology for a vaccine vesicle as a result. This has been partly due to the entreaties of the parents, who, wishing to evade the penalties of the law, yet had a natural dread of anything in the way of an operation; and partly to carelessness or ignorance on the part of the operator. In consequence, thousands of persons have in the course of the last half-century been certified as successfully vaccinated who were insufficiently vaccinated, or perhaps never vaccinated at all in the scientific sense. I venture to think that a considerable number of cases of Smallpox recorded statistically as occurring among the "vaccinated," occurred among these unfortunate individuals who really never had been sufficiently vaccinated.

The popular idea of vaccination is erroneous. Most people think that the slight operation of scoring the arm with a lancet and inserting any fluid supposed to be vaccine lymph is vaccination, and most persons who had undergone such an operation would probably unhesitatingly assert that they had been vaccinated. Now, this is not the scientific meaning of vaccination. Scientifically speaking, no person has been vaccinated who has not had a definite sequence of events result from the introduction of vaccine lymph under the skin. It is not the introduction of the lymph which is the vaccination, but the definite formation and subsequent progress of vaccine vesicles which is true vaccination. Vaccination, as scientifically understood, is the specific *result* of the inoculation of a *specific* virus. Consequently a person may be inoculated in four places, but only *vaccinated* in *one* if, as a result, this definite sequence to which I refer occurs only at one site of inoculation, while the remaining three do not "take." Though a person may be *inoculated* in six or more places, if none of these "take" in the

definite scientific sense, that person has *not* been vaccinated at all. Now, through ignorance of the meaning of vaccination, large numbers of persons in the kingdom are classed as vaccinated who never have been vaccinated. When this is borne in mind, a considerable number of persons who have contracted Smallpox, and who statistically appear under the heading "vaccinated," must be discounted. The statistics of the past, and even of the present, are therefore somewhat fallacious. The statistics of the future must be more carefully planned, with greater detail as to the number, nature, and character of vaccine vesicles and resulting scars. Our experience with other diseases besides Smallpox has taught us that there is no such thing as *absolute* immunity. An attack of an infectious disease, however, confers a very considerable degree of immunity against that particular disease after recovery; this immunity lessens as the years roll by. Vaccination, in the scientific sense, affords us a very high relative degree of immunity against Smallpox for a considerable period; but, just as the immunity conferred by an attack of infectious disease is not absolute, and gradually tends to diminish, so, too, the immunity conferred by vaccination against Smallpox follows the same law. In some persons it is more permanent than in others.

When vaccination was first discovered immunity was ill-understood, and extravagant claims were made (without the necessary life-long experience) that life-long immunity was conferred.

In the light of a century's experience and marvellous advances in scientific medical knowledge, those qualified by knowledge, training, and practical experience, and untrammelled by the exuberance born of a new discovery, can bring ripe, calm, and critical judgment to bear on the matter. Recent research and discovery in the realm of other diseases has placed vaccination against Smallpox (with lymph originally procured from a smallpox vesicle, and modified in character by passage through refractory animals) on a scientific basis, which until recently was denied it. Jenner's advocacy of vaccination was founded on observation, critical acumen, and logical deduction. He had stumbled on *a natural law of immunity*, which has received abundant scientific corroboration since in other directions. During the last few years our knowledge of immunity has increased by leaps and bounds.

Every year some fresh researches are recorded throwing light on various aspects of the question. A new literature has grown up which is practically an unknown language even to the ordinary medical practitioner, whose daily routine leaves him but little leisure for acquainting himself with recent research.

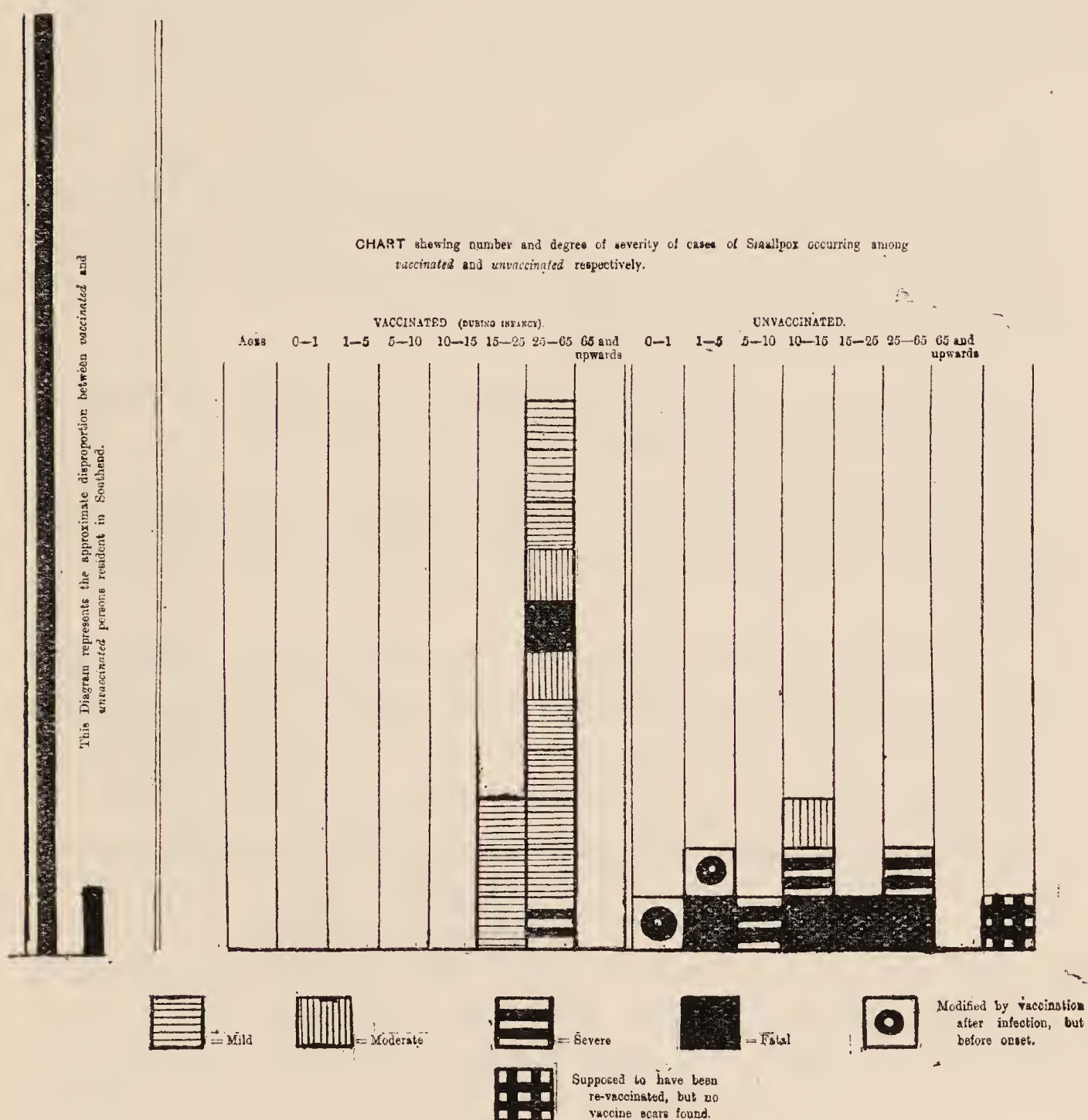
Attempts have been made to discredit the idea of a close relationship between Cowpox and Smallpox. No doubt some of the earlier experiments in this connection were of little worth ; but in those carried out since 1890 special precautions were taken to ensure sterilisation of instruments, &c., and to render the environment of the experimental animals such as to afford no likelihood of the communication of vaccinia. So many successful cases have been recorded under these strict precautions that it is almost impossible to resist the conclusion that a change of Smallpox into Vaccinia can really be brought about ; at any rate, a modification in the Smallpox virus has been achieved which makes its results *indistinguishable* from Cowpox. Dr. Collins and Mr. Picton at the time of the Royal Commission laid stress on the want of "evidence to show that inoculation of the pox of the cow on the human skin has ever produced Smallpox." This is a most unlikely process to occur in the inoculation of a single individual. By abundant experiments bacteriologists know that exaltation of virulence to any degree can only be attained by *successive* passages through a *series* of susceptible animals. Professor Crookshank has often been claimed as a supporter of anti-vaccination. He certainly exposed certain fallacies, but has always held a belief in *vaccine lymph derived from a variolous source** as conferring a certain degree of immunity against Smallpox. His contention has not been that vaccination is futile, but that "vaccination should be relegated to the position of a *voluntary auxiliary* measure." ("Bacteriology and Infective Diseases." Crookshank. Fourth edition, 1896, p. 293.)

In view of the above remarks, it is possible that a few persons supposed to have been vaccinated (and reckoned as such in the following rough estimate of the population of the Borough) are really unvaccinated in a scientific sense. Making ample allowance

* Most vaccine lymph in use is lymph originally derived from a variolous source.

for this would only inappreciably affect the attack rate, as estimated, among the unvaccinated in Southend, but would make absolutely no difference as to the conclusions drawn.

The accompanying chart depicts by variously marked squares the number and degree of severity of cases of Smallpox occurring among persons vaccinated in infancy, and unvaccinated persons, resident in Southend-on-Sea during the six months January to June, 1902.



Revaccination has been fairly extensively carried out in Southend during the last twelve months. From what I learn, the number of persons revaccinated runs into thousands. I have not exact figures, but I roughly estimate the recently-revaccinated residential

population at about 6,000. No case of Smallpox has occurred among this section of the population.*

The population of Southend roughly numbers about 30,000. Of these about 10,000 may be reckoned to be children under 15 years of age ; and of these, from various investigations I have made, I reckon that about nine-tenths have been vaccinated. One may therefore assume that at least half the population of Southend, or roughly some 15,000 persons, have been vaccinated within the last 15 years. Not one case of Smallpox has occurred among this moiety of the population. Assuming, as a fairly correct estimate, that there were about 1,000 unvaccinated persons under 15 in the Borough, it is to be noted that 7 cases of Smallpox occurred among these, 3 of them fatal. Of persons over 15 years of age, the majority have been vaccinated during infancy. I roughly reckon that there are about 20,000 persons over 15 years in the Borough, and that about 19,000 of these were vaccinated during infancy ; of these about 6,000 have been quite recently revaccinated.

Among the approximate number of 13,000 not recently vaccinated, 15 cases of Smallpox have occurred—1 fatal.

Among the remaining approximate number of 1,000 unvaccinated persons over 15 years of age, 3 cases of Smallpox have occurred—2 fatal.

The above may be roughly put in tabular form. [N.B.—The approximate figures given of the various sections of the population according to their state of vaccination may be varied to the extent of several hundreds without in any way affecting the point at issue.]

	Approximate No. of Persons of all ages.	No. of Cases of Smallpox.	No. of Deaths.
Vaccinated (within the last 15 years) .. about	15,000	0	0
„ (not vaccinated for over 15 years) ... about	13,000	15	1
Unvaccinated about	2,000	10	4

* Since this was written an apparent exception has occurred in the person of a girl from London engaged temporarily at the Smallpox Hospital.—*Vide infra*.

So far as Southend is concerned, then, we find that that moiety of the population which has been vaccinated within the last 15 years has not been attacked by Smallpox.

It is impossible to estimate the *exact* number of those recently vaccinated who have been exposed to infection, directly or indirectly, but it must be a very considerable number. To my certain knowledge, some 200 vaccinated and revaccinated persons have been exposed to direct infection. None have taken Smallpox—no matter what their age or conditions of life, in some cases none of the best. An apparent exception is referred to later on.

Out of a smaller population of about 13,000 persons who have not been vaccinated recently (within 15 years), 15 were attacked with Smallpox ; in only one instance had less than 20 years elapsed since vaccination, and that case was so mild that the patient never felt ill, his attack being limited to the appearance of a few pocks. On studying the chart it will be found that 14 of these 15 cases were of a mild or moderate nature—*the beneficial effects of infantile vaccination being still evident in mitigating the severity of the disease*, though the lapse of from 20 to 50 years since vaccination had lessened the immunity from attack which has been enjoyed by the revaccinated section of the community. Only one case among the vaccinated was severe and fatal. In this instance more than 35 years had elapsed since vaccination, and the infection was of a particularly virulent nature.

To come to the *smallest* section of the community—the *unvaccinated*. Out of the comparatively small number of about 2,000 persons, we find that no less than 10 in different parts of the Borough were attacked with Smallpox. Reference to the chart will further show that only one of these cases was of moderate severity, the other cases being all *severe* and dangerous, while no less than 4 proved fatal.

The attack rate, then, among the various sections of the community was as follows :

Among about 15,000 vaccinated within 15 years, not one single case.

Among about 13,000 not vaccinated for over 15 years, 1 in about every 800-900.

Among about 2,000 unvaccinated (at all ages), 1 in about every 200.

The case mortality (which can be definitely calculated) among the last two sections was 1 in 15 and 1 in $2\frac{1}{2}$ respectively ; or, in other words, 6·6 per cent. and 40 per cent. respectively. The total case mortality (not differentiating between vaccinated and unvaccinated) was 20 per cent.

The foregoing probable morbidity rate, and definite case mortality, may be placed in tabular form as follows :—

MORBIDITY RATE.

For Whole Population, per 1,000.	VACCINATED.		UNVACCINATED.
	Among about 15,000 Vaccinated within last 15 years, per 1,000.	Among about 13,000 Not Vaccinated for over 15 years, per 1,000.	Among about 2,000 Unvaccinated (at all ages), per 1,000.
·8	0	1·15	5·0
	Among about 28,000 Vaccinated, per 1,000. 0·53		

ACTUAL NUMBER of Cases of Smallpox occurring among—

Vaccinated within last 15 years.	Vaccinated more than 15 years ago.	Unvaccinated.	Totals.
0	15	10	25
DEATHS AMONG THE ABOVE.			
—	1	4	5
CASE MORTALITY.			
—	6·6 per cent.	40 per cent.	20 per cent.

From the above it will be seen that the attack rate among the unvaccinated was actually ten times as great as among the vaccinated, in spite of the fact that over 95 per cent. of known contacts

who were exposed to infection were vaccinated. On the other hand, five out of six unvaccinated persons who were known to have been exposed to infection were attacked with Smallpox.

The experience of Southend then, is certainly a striking testimony to the efficacy of vaccination and revaccination in the prevention or mitigation of Smallpox. It may be argued that the population is too small and the figures too few to draw general conclusions from. This may be admitted *pro tanto*. The larger the available figures, the more reliable, certainly, will be the deductions. No conclusions whatever can be drawn from a single case, and isolated instances of revaccinated persons taking smallpox, do not bear witness to the inefficacy of vaccination, but to the probable inefficiency of a particular attempt at vaccination.

To draw reliable conclusions, we want, then, larger figures than can be given in Southend. We want also a large population which can be divided into two great groups of "Recently vaccinated," and "Not recently vaccinated." Fortunately such an instance is to hand in a report on the recent prevalence of Smallpox in Glasgow, the second largest city in the kingdom, with a total population of persons over five years of age, of 675,887, as estimated on January 1st, 1901.

These 675,887 persons are reckoned by Dr. Chalmers, M.O.H., in one great class as *not recently vaccinated*—(perhaps some 20,000 of them had been revaccinated within the previous three years). A very large amount of revaccination has recently taken place in Glasgow for the purpose of preventing the spread of Smallpox. The numbers of revaccinations during the two years to May 3rd, 1902, are recorded as 404,855. Dealing with these large figures, we can reasonably expect to draw sound conclusions as to the influence of revaccination in the prevention of Smallpox.

The following table selected from one prepared by Dr. Chalmers teaches the lesson in no uncertain manner. The table requires and deserves careful consideration. It shows how a gradual transference of this population had been taking place from the "not recently vaccinated" to the "recently vaccinated" group. The facts as to the transference, fortnight by fortnight, and as to the incidence of Smallpox in each group are given in the table, as follows :—

1901	Not recently vaccinated.		Recently vaccinated.	
	Population.	Cases Registered.*	Population.	Cases Registered.
January 12th ...	675,877	23	0	0
„ 26th ..	674,816	350	1,071	0
February 9th ...	671,025	202	4,862	0
„ 23rd ...	634,213	127	41,674	0
March 9th ...	556,561	299	119,326	0
„ 23rd ...	518,426	161	157,461	0
April 6th ...	474,694	92	201,193	0
„ 20th ..	429,056	67	246,831	0
May 4th ...	384,371	28	291,516	0
„ 18th ...	366,125	18	309,762	0
June 1st ...	352,633	11	323,254	0
„ 15th ...	347,777	2	328,110	0
„ 29th ...	345,293	8	330,594	0
July 13th ...	281,867	1	394,020	0
November 16th ...	279,452	1	396,435	0
„ 30th ...	279,232	5	396,655	0
December 14th ...	279,020	4	396,897	0
„ 28th .	278,796	0	397,091	0

(* These figures include some 60 cases occurring in children under five, which may be subtracted from the total without in any way affecting the point at issue. 54 of these 60 were primarily unvaccinated.

At the beginning of 1902, the population of 675,877 persons in Glasgow over five years of age, can be divided into a larger recently vaccinated moiety of no less than 397,091 and a smaller not recently vaccinated moiety of 278,796. The seasonal incidence of Smallpox in the British Islands is heaviest during the first five months of the year. Starting with a recently vaccinated population in January, 1902, already 120,000 in excess of the not recently vaccinated population, and bearing in mind that this difference was being gradually accentuated fortnight by fortnight, what are the facts as to the incidence of Smallpox on these two sections of the community? The recently vaccinated—now very much the larger—moiety, remained as absolutely free from Smallpox as when in a minority; all the cases occurring among the diminishing number of “not recently vaccinated” persons. This is seen on reference to the figures for 1902, as follows :—

1902.	Not recently vaccinated.		Recently vaccinated.	
	Population.	Cases Registered.	Population.	Cases Registered.
January 11th ...	278,623	28	397,264	0
„ 25th ..	278,152	23	397,735	0
February 8th ...	277,653	23	398,234	0
„ 22nd ..	277,134	147	398,753	0
March 8th ..	276,043	92	399,854	0
„ 22nd ...	274,611	85	401,276	0
April 5th ...	272,694	36	403,193	0
„ 19th ..	271,619	15	404,268	0
May 3rd ...	271,032	10	404,855	0

In the presence of such facts we may well ask with Dr. McVail, Is it still possible to argue that vaccination does nothing to protect against Smallpox? It must be borne in mind that where revaccination was most resorted to was in those districts in which Smallpox was most prevalent. Therefore, on the whole, the recently revaccinated included those specially exposed to infection. To quote Dr. McVail, “Fortnight after fortnight, from the beginning of January, 1901, till the beginning of May, 1902, the experiment was repeated of allowing Smallpox to differentiate between the ‘Recently revaccinated,’ and those ‘Not recently vaccinated.’ Whatever the numbers were in the two groups, the behaviour of Smallpox with regard to them never varied,” persistently picking all its victims from among the not recently vaccinated. “Wealth or poverty, cleanliness or dirt, drunkenness or total abstinence, youth or age, made no difference to the recently revaccinated so far as Smallpox was concerned. They remained immune right from the beginning of the epidemic to the end.”

The working class population of Glasgow live in large tenement buildings of 3 or 4 or 5 flats, each flat containing several separate dwellings opening into common passages or stairways. “The people lived together in these great tenements, subject to the same sanitary or insanitary conditions, their children attending the same schools, and themselves engaged in the same occupations. They differed only in this one respect, that some had submitted to revaccination, and others had refused. Smallpox left the former class absolutely unscathed, and found all its victims among the latter.”

No cases of Smallpox occurred then among recently vaccinated persons in Glasgow, and only 19 cases in all occurred among persons who had twice been vaccinated previously. In 11 of these cases, 10 years or more had elapsed since the last vaccination, and in no case was there a less period than 3 years. What are these among so many? Besides, we have no information as to the character of the scars left by these revaccinations.

The only case of Smallpox which I personally have seen in a so-called revaccinated person occurred at the end of June, 1902, in a young girl of 17 who was engaged as a wardsmaid at the Smallpox Hospital. She was certified to have been vaccinated at Battersea a few weeks prior to her entering on her duties. When she began to be ill, examination of her supposed vaccination showed merely 3 red marks, without any trace of scarring or foveation such as signify true vaccination. No marks of vaccination were found at all and the patient suffered from a severe and *unmodified* attack of Smallpox. I made enquiries as to the source, age and quality of the 'lymph' used by the certifier of successful vaccination, but silence was maintained on this point. Judgment must therefore go by default, and I think that the antecedents of the 'lymph' used probably will not bear investigation. I should not be surprised if it were not only 'inert,' but proved to be nothing more than pure glycerine without any admixture of 'lymph' whatever.

The accompanying table gives particulars of each case recorded in Southend-on-Sea since January 1st, 1902. It will be noted that the case of the wardsmaid at the Smallpox Hospital which has received special mention in this Report, occurred some weeks after the last notified case of Smallpox in the Borough, and about 4 weeks after I wrote my report for the month of May, in which I stated that "fully protected persons are only those who either (1) have had a recent attack of Smallpox, or (2) have recently been successfully vaccinated. Such persons (with such rare exceptions, if any, as to prove the general rule) cannot take Smallpox."

Were it my intention to endeavour to protect the certifying practitioner, I might, in recording this case, place it under the "rare exceptions" mentioned in the last sentence, quoted from my report for May. The case is however, in my opinion, *no exception at all*. The simple fact is that in the scientific sense the girl was

SOUTHEND-ON-SEA SMALL POX HOSPITAL.

List of Small-pox Patients admitted from February 3rd, 1902, to June 25th, 1902, inclusive, with particulars of their condition as to Vaccination, as recorded on individual Vaccination Bed-Cards.

Consecutive Number.	Name of Patient.	Parish.	Age.	Date of Admission to Hospital.	Date of Discharge from Hospital.	If Fatal, date of Death.	Type of Disease.	PRIMARY VACCINATION.								RE-VACCINATION.			
								A. Presenting a Vaccination Cicatrix or Cicatrices.*			B. Presenting no Vaccination Cicatrix or Cicatrices.*				C. Presenting no Vaccination Cicatrix or Cicatrices, but showing marks of Vaccination performed subsequently to the case having been infected by Small-pox.		D. Stated to have been successfully Re-vaccinated.		E. Stated to have been Re-vaccinated but unsuccessfully: if so, when, and what evidence that the operation was unsuccessful.
								Their number.	Their approximate area (sq. inch)	Age at Vaccination.	Stated to have been Vaccinated, and age at Vaccination.	Not stated to have been Vaccinated.	Stated to be Un-vaccinated.	Vaccination stated to have been performed, but never successfully.	Date of such Vaccination.	Date of appearance of Small-pox eruption.	How long since last successful Re-vaccination.	Nature of evidence available (from patients' statements, Cicatrices, &c.) as to success of Re-vaccination.	
1	Mrs. W.	St. John's	37	Feb. 6	Feb. 27	—	Very mild discrete	4	Over ½ sq. in.	Infancy	—	—	—	—	—	—			
2	Mrs. C.	All Saints	31	Feb. 3	Mar. 2	—	Very mild discrete	3	Over ½ sq. in.	Infancy	—	—	—	—	—	—			
3	T. W.	„	59	Feb. 9	—	Feb. 16	Astacoid Confluent	—	—	—	—	—	Yes	—	—	—			
4	O. W.	„	16	Feb. 9	Feb. 28	—	Very mild discrete	3	Over ½ sq. in.	Infancy	—	—	—	—	—	—			
5	R. J.	„	7	Feb. 13	Apl. 17	—	Confluent severe Sequelæ abscesses	—	—	—	—	—	Yes	—	Feb. 12	Feb. 12			
6	T. C.	St. John's	41	Mar. 10	Apl. 11	—	Moderate Semi Confluent	4	Over ½ sq. in.	Infancy	—	—	—	—	—	—			
7	E. E. C.	„	2 months	Mar. 20	Apl. 7	—	Discrete, mild	—	—	—	—	—	Yes	—	Mar. 10	Mar. 19			
8	R. C.	„	3 8/12	Apl. 5	—	Apl. 11	Very severe Confluent	—	—	—	—	—	Yes	—	—	—			
9	A. B.	„	12	Apl. 10	May 24	—	Semi Confluent Sequelæ Abscesses	—	—	—	—	—	Yes	—	Apl. 10	Apl. 9			
10	D. O.	All Saints	11	Apl. 10	—	Apl. 21	Confluent Very severe	—	—	—	—	—	Yes	—	—	—			
11	D. W.	„	22	Apl. 12	May 5	—	Very mild discrete	4	Over ½ sq. in.	Infancy	—	—	—	—	Apl. 12	Apl. 7			
12	C. M.	St. Alban's	27	Apl. 12	May 29	—	Mild discrete	—	—	Infancy	—	—	—	—	—	—			
13	C. T.	St. John's	18	Apl. 18	—	Apl. 20	Hæmorrhagic	—	—	—	—	—	Yes	—	—	—			
14	P. F.	„	42	Apl. 19	June 7	—	Semi Confluent moderate	0	—	—	Infancy	—	—	—	—	—			
15	D. D.	„	12	Apl. 19	June 7	—	Moderate Semi Confluent	—	—	—	—	—	Yes	—	—	—			
16	M. M.	St. Albans	24	Apl. 22	June 11	—	Mild discrete Sequelæ abscess	—	—	—	—	—	Yes	—	Apl. 12	Apl. 20			
17	L. M'C.	St. John's	35	Apl. 22	—	Apl. 24	Hæmorrhagic	No note	—	Infancy	—	—	—	—	—	—			
18	E. J.	„	36	Apl. 23	July 17	—	Confluent on face moderate	3	—	Infancy	—	—	—	—	—	—			
19	E. P.	St. Mary's	32	Apl. 25	June 24	—	Severe	4	½ sq. in.	Infancy	—	—	—	—	—	—			
20	W. C.	„	17	Apl. 27	May 28	—	Doubtful on admission	—	—	Infancy	—	—	—	—	—	—	A few Weeks		
21	F. S.	St. John's	28	May 28	July 16	—	Severe. Sequelæ abscesses	—	—	—	—	—	Yes	—	—	—			
22	P. S.	„	31	June 2	July 3	—	Mild discrete	1	½ sq. in.	Infancy	—	—	—	—	—	—			
23	L. G.	Visitor	25	June 5	June 23	—	Very mild discrete	2	Over ½ sq. in.	Infancy	—	—	—	—	—	—			
24	M. S.	St. John's	58	June 17	July 18	—	Moderate	—	—	—	Infancy	—	—	—	—	—			
25	A. W.	(St. Mary's) Hospital	17	June 25	Aug. 6	—	Severe Confluent	0	—	—	Infancy	—	—	—	—	—	June 5	3 red marks—No Cicatrices or other evidence of true Vaccination	June 2nd, after exposure to infection by contact with No. 22. No result.

* Cases in which it is doubtful whether scars present on the usual site of Vaccination can be referred to Vaccination, and those also where scars affirmed to be present are obscured by copious eruption, should be entered in Column A, with an explanatory note.

† This proved subsequently not to be Small-pox.

unvaccinated, and showed *no* evidence of vaccination. All other persons engaged in carrying on the work of the Hospital, including the removal of patients, had been revaccinated by myself, with the exception of two who had definitely had Smallpox. All those vaccinated by me shewed results which could be certified as "vaccination" in the scientific sense as defined earlier in this report. Four of these persons were under 25 years of age. But when this girl from London began to show symptoms of Smallpox and her arm was examined, it was found that though 3 red marks were present on the upper arm, these marks were not of the usual character produced by vaccination, nor were any marks of infant vaccination to be found. These facts were pointed out to her sister who was nurse in charge. I suspected that the lymph that had been used for this "certified" vaccination was unreliable and inert. I accordingly sent the certifying practitioner the following letter, dated July 2nd, 1902.

Dear Sir,

I shall be obliged if you will let me know what lymph you used for vaccinating A. W., of 13. O——. Street, London, S.E. I should like, if possible, to know the origin of the lymph, its probable age, and whether the results were typical, &c. I may say in confidence that A. W. has unfortunately been attacked with Smallpox. If the lymph is not quite reliable, I thought it would be as well to let you know, otherwise other persons inoculated with the same lymph may be under a false sense of security.

Yours faithfully,

Medical Officer of Health.

As I expected, I received no reply. I am confident that the lymph would not bear investigation. The poor girl had never been vaccinated at all in the scientific sense, and fell a victim under a false sense of security. To instance how effectual *efficient* vaccination is in protecting from Smallpox, I cite the following. One patient admitted to Hospital was a visitor, a young woman who had come to Southend with the incipient symptoms of Smallpox. She had a baby aged 6 months with her. As no proper provision could be made for the baby outside, and an examination of its arm revealed 3 typical full-sized vaccination scars of a satisfactory nature, I took the baby into Hospital with its mother. In spite of its tender age, and the concentrated poison of Smallpox in which it lived at the

Hospital, it remained perfectly well, a striking testimony to the efficacy of vaccination in affording protection against Smallpox during the most susceptible time of life.

In a community insufficiently protected against Smallpox by lack of recent vaccination, provision of isolation hospital accommodation is absolutely necessary, so that a case of Smallpox can be isolated as soon as possible ; but even the provision of an isolation hospital with a well administered ambulance service for the immediate removal of a case, must obviously fail to effect early isolation in every case. Thus in one instance in this Borough, I only learnt of a case of Smallpox through receiving a report from a schoolmistress that a child was being kept at home, stated to be suffering from "measles," and no doctor in attendance. I immediately set out to visit this child, who was unvaccinated, and found her with a severe and well-marked attack of Smallpox in a dirty house in a thickly populated district. Immediate vaccination and quarantine of all contacts until after disinfection, and removal to Hospital of the patient as soon as possible, happily prevented any spread of the disease ; but it is easy to see that the principle of isolation apart from vaccination, was in jeopardy owing to the ignorance or carelessness of the parents of the child. Isolation alone would similarly fail in the event of Smallpox occurring in a family of the Peculiar People sect, in view of their peculiar tenets. An isolation hospital without a staff of well vaccinated attendants would be impossible of maintenance, because the majority of the staff would inevitably succumb to Smallpox, unless only persons who had recently suffered from Smallpox were employed.

By the aid of vaccination we can safely staff our Hospitals with persons *vaccinated in the proper sense of the term*, without any fear of the staff being placed 'hors-de-combat.' This is well illustrated by our own experience where the only person to take the infection was one who showed no scientific evidence of vaccination. Thirteen other persons (two of whom had previously had Smallpox, while the remainder were recently vaccinated in the scientific sense of the term) had to do with the removal, or treatment, or burial of the Smallpox sick. They included persons from 16 to 70 years of age, and all remained immune. I venture to say that if it were possible to get a similar number of unvaccinated persons of sufficient courage

to attend to the Smallpox sick, at least 50 per cent. of such unvaccinated attendants would in the course of a single fortnight be patients in the wards, requiring a new staff to wait on them, and rendering the Hospital useless for want of accommodation for any fresh cases arising in the district outside the Hospital. It is an experiment I recommend to the Anti-vaccination champions for the good of their cause. If they can show even 12 persons unprotected by a previous attack of Smallpox or by vaccination, capable of administering an isolation hospital for the Smallpox sick, they will indeed effect a notable achievement which will advance their cause in a month more than all their diatribes have during the last 50 years.

The Infectious Diseases (Notification) Act, does not apply to any hospital in which persons suffering from an infectious disease are received. It is, therefore, not usual to report to the Council cases of infectious disease occurring among the staff in Hospital, though reference is generally made to these in the Annual Reports.

The case of the Wardsmaid at the Smallpox Hospital occurred when the Borough was free of Smallpox outside the Hospital. Moreover, as it was just about the beginning of the height of the season, it seemed desirable in the interests of the Borough (considering the complete isolation of the case), to defer comment on the case until a more convenient season. The facts of the case when closely gone into revealed that it was not vaccination, but *the want of proper vaccination*, which had failed to protect the girl from Smallpox. It is highly important therefore that the case should be duly and fully recorded. Nor must those who have an axe to grind *re* antivaccination quote the case as one occurring in a recently vaccinated person, without recording at the same time that it was the gravely, deliberately and conscientiously expressed opinion of the Medical Superintendent that the patient had *never* been vaccinated in the correct sense of the term; that there was no scientific evidence of vaccination, and lastly that the attack of Smallpox was *absolutely unmodified*, identical with the type of case met with in unvaccinated persons, and not in any way resembling the modified type of the disease, met with in persons who have once been successfully vaccinated.

In endeavouring to trace the source of infection in each case of Smallpox that occurred in Southend, the following facts were elicited : The first case which occurred in December, 1901, is fully dealt with in my Annual Report for 1901. This patient had visited at an infected house in Aveley. The source of infection in the second case was never discovered definitely. The lad was employed at a drapers, had not been out of Southend, and had so mild and modified an attack, that there was much difficulty in arriving at a diagnosis. In the next two cases also there was no evidence of direct infection to be obtained. These occurred almost simultaneously, one in All Saints', and one in St. John's. In the latter case there was just a possibility that the husband (who was protected by a previous attack of Smallpox), might have carried infection unwittingly from London. The next two cases were secondary, and occurred in unvaccinated persons. One was the result of direct infection, the other of indirect infection from a previous case. Both of these cases were very severe, and one proved fatal. Both occurred in All Saints' parish. The next case had been in contact with a tramp from Rochford Union, where Smallpox soon after broke out. This was a case of modified Smallpox occurring in a man aged 41, who had not been vaccinated since infancy. The case was not recognised, and consequently not notified for a week. In the meantime an unvaccinated infant had taken the infection. An endeavour to vaccinate the infant, which was carried out immediately after the recognition of the father's malady, happily was partially successful and succeeded in modifying the oncoming attack. Eight cases which occurred during April, coincided with an incubation period dating from the influx of excursionists for the Easter holidays. All had been in contact with excursionists. One secondary case occurred in the person of an unvaccinated child aged 2, who had been exposed to infection for a week. Immediate vaccination on notification of the father's malady, again was happily partially successful, and mitigated the oncoming attack of Smallpox. One unvaccinated youth aged 18, contracted malignant hæmorrhagic Smallpox in an infected district in London, and one unvaccinated girl aged 11, contracted severe confluent Smallpox, in all probability indirectly through her father (vaccinated in infancy) having been employed in an infected district. One unvaccinated child, aged four, contracted a severe attack of Smallpox, in all probability from one of the previous cases (an uncle). These three last cases all proved fatal. Vaccination had been

neglected and rejected by the parents. In the case of the child aged four the remarkable predilection of Smallpox for one of the two unvaccinated members of a large family, coupled with the selection by Smallpox of the infant cousin (the one unvaccinated member of the uncle's large family), impressed the deluded parents in a convincing, if heart-rending, manner.

Subsequent to this vaccination was vigorously prosecuted in the infected neighbourhoods, and the Borough remained free of Smallpox until the end of May, when an unvaccinated man in another quarter of the Borough was found to be suffering from the disease. The incubation period probably dated from Whit Monday, when he was in contact with London excursionists. The next case, which occurred early in June, in a man aged 35 not vaccinated since infancy, was also probably due to contact with an infected person among the Whit Monday excursionists. A secondary case occurred in the same house in the person of a female aged 56, on whom an unsuccessful attempt at vaccination had been made *after exposure to infection*. The last case of all was imported from Rochester in the person of a young married woman who had been successfully vaccinated in infancy. She had a very mild, modified attack. Her vaccinated infant at the breast escaped entirely. This was the last case which occurred in the Borough outside the hospital, but towards the end of June a newly-engaged wardsmaid fell ill in the hospital, as already described.

Preventive Measures.—In order of merit, these may be stated as follows :—

- (1.) *Antecedent* recent successful vaccination. (No case of Smallpox occurred among that section of the population which wisely sought antecedent vaccination, though it included the great majority of those who were constantly visiting infected districts in London. If this measure had been universally practised Smallpox would not have invaded the Borough.)
- (2.) Immediate *isolation* of a notified case of Smallpox. (Some think that isolation alone is sufficient to check Smallpox. Yet, as is shewn in the above report, (*a*) errors of diagnosis, (*b*) neglect to call in early medical advice, and (*c*) the

ready susceptibility of any unvaccinated contact to take the infection, render this measure, apart from vaccination, anything but sufficient—valuable as it is in any community which is only partially protected. Smallpox hospitals would have to be converted to other uses were vaccination and revaccination periodically carried out on all persons.

(3). Immediate vaccination of all contacts. This is generally agreed to even by opponents of vaccination when Smallpox is in a house. Indirect contacts however, sometimes escape vaccination, and frequently are subsequently attacked with Smallpox.

(4). *Disinfection.* This important measure includes :—

- (1). Disinfection of all infected rooms and articles of clothing (of contacts and patient) and furniture.
- (2). Disinfection of contacts by thorough bathing.

The means of disinfection employed by me were as follows :—

- (1). Rooms with all infected articles were sealed up and fumigated with SO_2 gas for several hours.
- (2). Moveable articles capable of disinfection by steam were then removed for disinfection in the Borough Steam Disinfector.
- (3). Other articles and the walls of the room were then sprayed over with a solution of formalin (1 in 1,000), then washed down.
- (4). Final drying and disinfection by thorough exposure to the air and if possible to the sun.
- (5). Surveillance of contacts for a period of 15 or 16 days. (Should a secondary case occur it is immediately removed to the Hospital). After vaccination and disinfection had been carried out it was not found necessary to quarantine persons for the whole period provided that they were kept under observation. Where the period of exposure to infection had been under a week, no secondary cases occurred among a large number of successfully vaccinated contacts.

It has been deemed necessary to make somewhat copious remarks on the protective nature of vaccination, because there yet

exist many persons in great ignorance of the real issues of the question.

The following paragraphs were presented by me in the discussion on Smallpox and vaccination at the meeting of the British Medical Association in Manchester last July.

A practitioner from a southern coast town once informed me that an elderly practitioner in his neighbourhood, during a period of over 30 years had certified as "vaccinated" cases in which he had induced some inflammatory reaction by the introduction of simple glycerine. Perhaps this worthy did not believe in the efficacy of vaccination, but it is a matter for congratulation that the profession numbers but few such downright knaves among its ranks. To befool people, and give them, not only no protection, but a false sense of security against the most loathsome of maladies, is an indescribably greater iniquity than the obvious one of obtaining money under false pretences.

Not only should a standard of "efficient" vaccination be laid down by law, but an independent and well qualified observer should be appointed to decide whether this standard has been reached in any certified case. In so important a matter, it should be made an impossibility for a person to be defrauded or placed under a false sense of security. All lymph used, even if not manufactured by the government, should at any rate be supervised by the government, and no lymph should be permitted to be used which has not the government seal of approval. No certificate of successful vaccination should be accepted which does not state the number, area and *character* of the resulting scars. No person should be permitted to practice vaccination who has not a practical and theoretical knowledge of the most approved methods of preparing and storing vaccine lymph, and who has not practically demonstrated under a duly qualified examiner's eye that he is capable of performing vaccination in an "efficient" manner. He should be fully acquainted with the stages of evolution and involution of a vaccine vesicle, and with the characters of the resulting vaccine scars. Every person who performs a vaccination should be required to keep a register, stating the source of the lymph and its certified age and activity, as well as the results obtained after inoculation.

N.B.—There is no doubt that the vast majority of vaccinations done in this country satisfy the scientific definition of vaccination, but it is important that unsatisfactory inoculations should be reduced to the lowest minimum.

It seems to me that the most promising method of dealing with the matter, would be by the appointment of specially qualified men Public Vaccinators under the direction of the Medical Officer of Health of a district. This can only be effected by new legislation. The period of probation of the Vaccination Act, 1898, has almost expired* This, no doubt, is one reason why the British Medical Association arranged for a discussion on the means by which we may hope to secure the maximum advantage from vaccination. As the outcome of our serious considerations and deliberations I trust the bases of a good working Act will be placed before our legislators, and that efficient regulations will be made as to the source, purity and activity of all lymph ; as to the qualifications of public vaccinators; as well as to revaccination during adolescence.

J. T. C. NASH, M.D., M.S., D.P.H.,
Medical Officer of Health,

* It is an anachronism that the duties of administering the Vaccination Acts should be under Boards of Guardians.

